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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/610,640	07/05/2000	Koji Eriguchi	43889-951	5513

7590 05/25/2004

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EXAMINER	
EVERHART, CARIDAD	
ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/610,640	ERIGUCHI ET AL.	
	Examiner	Art Unit	
	Caridad M. Everhart	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *41,42,45,46,54-68,73-83,85-90 and 95-140* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *62-66* is/are allowed.

6)☒ Claim(s) *41,42,45,46,54-61,67,68,73-83,85-90,95-140* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The indicated allowability of claims 41,42,45,46,54-61,67,68,73-83, 85-90, 95-140 , is withdrawn in view of the newly ~~discovered~~ applied combination of reference(s) to Maris (US 5,706,094). Rejections based on the newly cited reference(s) follow.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims41,42,45,46,54-61,67,68,73-83,85-90,95-140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maris (US 5,706,094) in view of Liu, et al. ("Liu")(US 5,604,581).

Maris discloses the steps of supplying a measurement light to a region of a semiconductor substrate, intermittently supplying an exciting light to the same region and calculating a change rate of the reflectance(col. 5, ines 52-57; col. 6, lines 17-20; col. 9, lines 21-28). The excitation beam is made intermittent by a chopper(col. 8, lines 55-61). The method calculates the difference between the intensity of the reflected beam when the area of the substrate is excited by the excitation or pump beam and when it is not (col. 9, lines 22-28). That the quantity is a ratio is understood by that the change of reflecitivity is normalized (col. 12, lines 60-65). It is well known in the art to calculate a ratio in order to normalize a quantity such as the reflectivity . With respect to the frequency of the intermittent beam, Maris encompasses the frequency of 1kHz by the disclosure that it was known to use a chopping frequency of 1kHz(col. 3, lines 48-50). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to have used this rate which was known in the prior art in order to obtain

similar results for the same materials as used in the prior art. With respect to the wavelength, Maris discloses wavelengths in the recited range(col. 10, lines 20-25 and col. 15, lines 50-54). Maris also encompasses the teaching of implantation damage and heat treatment for the repair of such damage(col. 1, lines 63-67 and col. 2, lines 1-14). It would have been obvious to one of ordinary skill in the art at the time of the invention that the method disclosed by Maris could be used to detect the thickness of the layer in which the changes caused by the implantation takes place and to measure the changes that occur in the layer during the heat treatment. Maris further discloses the calculating by computer of a reference curve using the data, which curve is then used in the control of a process by comparing measured values to the computer model(col. 16, lines 24-31). This would satisfy the limitation of comparing a process value with the desired or proper value in the control of a process. .

Maris discloses the method for determining the thickness of a layer in a doping process and is silent with respect to an etching process or depostition process.

Liu is relied upon for its disclosure that reflectance measurement can be used for in situ determination of thickness in a doping process or in an etching process or deposition process(col. 8, lines 2-5 and col. 9, lines 12-24) and process control(col. 9, lines 25-40). Liu also includes thermal treatment among the processes that can be monitored. It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied the process taught by Maris to this process in view of the disclosure made by Liu because Maris discloses the implantation damage and the heat treatment of anneal for the recovery of the layer.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the process taught by Maris in an etching process or deposition process in view of the disclosure made by Liu because all three processes are processes in which light can be reflected off of a substrate region in situ in order to determine the thickness of a layer.

With respect to the n-type silicon, this is conventional in the art and therefore it would have been obvious to one of ordinary skill in the art to use n-type silicon. With respect to the energy of the measurement light, this is a variable of the art which it is within the ordinary skill in the art for one of ordinary skill in the art to determine for the particular material which is being evaluated.

Allowable Subject Matter

Claims 62-66 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart
PRIMARY EXAMINER

C. Everhart
5-19-2004